and yet think we might do something to help forward the good cause by co-operating with others.

The immediate objects of such an association should be in my opinion (1) To collect and distribute information connected with the subject; (2) To induce examining bodies to frame their questions in geometry without reference to any particular text-book.

RAWDON LEVETT

King Edward's School, Birmingham

Philology and Darwinism

MR. FARRAR'S interesting communication on this subject in a recent number of NATURE, suggests to me a few remarks. As one who has paid considerable attention to the various dialects existing throughout Scotland, as well as to the manner in which our Gaelic-speaking population is by stern necessity obliged to attempt the pronunciation of Anglo-Saxon words, I have become thoroughly convinced that the growth, life, and death of languages are subject to fixed laws. The Highlander whom I meet and who tells me this is a "Koot tay" is as unconsciously obeying Grimm's law of the transposition of consonants as the sun above him is obeying Newton's law of gravitation.

There is this difference, however, between Mr. Darwin's teachings regarding animals and the changes of language, that whereas those animals whose breeding and training are most subject to man's conscious action exhibit the greatest amount of variability, those dialects which are the most neglected and despised by educated men, and which, in this respect, may be called the weeds of speech, are far more variable than Queen's English, watched over as the latter is by such a host of school-masters, lexicons, and grammars. The difference of pronunciation of the same words in different counties is great, while many words in the dialect of one county are quite unknown in that of another, in this respect presenting a striking analogy to the Flora of the country. Even in words formed from sound, in which case, at first thought, we might expect considerable uniformity, the difference is often very marked, as between Scotland and England. The words imitative of the animal voice, or of the different cries of the same animal under different sensations are sometimes unlike, for the horse *neighs* and the cat *mews* in England, whereas they respectively *nicher* (*ch* guttural), and *nyioo* in Scotland. Sometimes the imitative word is from the sound of different organs, as *lapwing* in English from the flap of the wing; *peewit* in Scotland from the sound of the voice. Generally people so ignorant as to be necessitated always to express their thoughts in a rustic dialect, do so with the assistance of more or less gesture, and even this gesture is not quite whimsical, but has family and county resemblances. In conclusion, my impression is that the dialects which run wild are much more variable than those under man's care, which is the reverse of the case with wild and domestic animals and plants.

S. J.

Xanthidia in Flint

DR. CARPENTER, in his recent lecture at the Royal Institution on "the Temperature and Animal Life of the Deep Sea," speaks of the resemblance of the globigerina mud to chalk as being "greatly strengthened by the recognition of several characteristically cretaceous types among the foraminifera scattered through the mass of *globigerinæ*, of which it is principally composed; as also of the *Xanthidia* frequently presented in flint. (NATURE, vol. i., p. 564.)

The precise nature of the spinous orbicular bodies found in flint, and generally called *Xanthidia*, has hitherto been a matter of some doubt. Ehrenberg described them as fossil species of his genus of supposed polygastric animalculæ, *Xanthidium*. Their structure, however, differs in many respects from true *Xanthidia*, which form a genus of *Desmidieæ*, now universally admitted to be vegetable organisms, and, like nearly all desmids, having compressed bipartite cells, whilst the fossils have globose and entire cells. The most recent opinion has been that they are the fossil sporangia of other species of *Desmidieæ*, and they do indeed bear considerable resemblance to the sporangia of various species of the genera *Micrasterias*, *Euastrum*, *Staurastrum*, *Cosmarium*, and *Closterium*. An objection to this opinion arises from the fact that *Desmidieæ* are (so far at least as at present ascertained) exclusively fresh-water plants, and do not appear at all adapted for a deep-sea existence; whereas on the other hand, the chalk containing the flints may now be said to have been conclusively proved to have been formed at a considerable depth at the bottom of the sea: and the other organisms with which the fossils in question are found associated are undoubtedly marine.

The discovery of these *Xanthidia* (?) then, at an ocean depth of 767 fathoms, is a most important fact, whatever their nature may be; what that nature is, I, and I doubt not many others of your readers, would be glad to learn from Dr. Carpenter, or others who have had an opportunity of seeing the specimens he alludes to.

Winchester, May 14 FRED. J. WARNER

What is a Boulder?

WITH all terms in ordinary use there is a looseness of meaning, which, while not in the least degree inconvenient in common language, becomes so when transferred to the would-be-exact nomenclature of science.

Hobbes says, "A name is a word taken at pleasure to serve for a mark which may raise in our own mind a thought; like to some thought we had before, and which being pronounced to others may be to them a sign of what the speaker had or had not before in his mind."

It is obvious, however, that a name pronounced by a speaker, or written by an author, can only raise, in the minds of others, the proper thought, when the exact meaning of such a name has been agreed upon by those who make use of the name; and it appears to me desirable that in all cases when names in common use are transferred to the language of science, their exact meaning should be stated. In some sciences, as in botany, this is done, where such terms as leaf, stem, root, &c., are defined apart from their ordinary signification, but much remains to be done in this way. Thus, take the query at the head of this letter. I have tried to find out exactly what a boulder is, and I completely fail. According to Dance a boulder is "a mass of rock, whether rounded or not, which has been transported by natural agencies from its native bed." This definition is excellent at first sight, but it fails, as the term "mass of rock" conveys no clear idea as to size. Ask half-a-dozen persons the smallest size they would attribute to a mass of granite, and the answers would vary considerably. One cannot see why the smallest piece that would contain the constituents of the rock should not be called a mass, and in that case many of the large grains of sand on a granitic coast would be included in the term "boulder." But this is absurd, for we might then speak of carrying half a dozen boulders in the waistcoat pocket, or a geologist might suffer from having a boulder blown accidentally into his eye! There is apparently no determinate size at which a boulder begins or ends; but it seems to me desirable that some idea of size included should be given in the definition, and I would ask some of your readers to be good enough to state what they understand by a "boulder," with a view of getting an exact idea of the meaning of this frequently used term.

Midland Institute, May 9 C. J. WOODWARD

The Anglo-Saxon Conquest

A CORRESPONDENT, writing under the signature "A. Hall," in your issue of last week, suggests that in laying certain statistics as to the longevity of the Romano-Britons before the Royal Institution, I had "forgotten that the youth of Romano-Britain had for many generations been forcibly expatriated, drafted abroad to feed the armies of Imperial Rome." Your correspondent "appears to have forgotten" what the *résumé* of my lecture stated, viz., that my observations related to the time of Cerdic; and he will now no doubt recollect that a space of about three generations intervened between this period and the one to which he refers. Less than three generations is a sufficiently long period to allow of the balance which the Romano-British population is supposed to have suffered by being drafted into the Roman armies, righting itself.

I have, in a memoir which the Society of Antiquarians has honoured me by publishing in the "Archæologia" of this year, given other reasons, and these at greater length, for holding the explanation which your correspondent suggests for my statistics to be erroneous. I do not in that memoir quote, in illustration of and as a means of expressing that explanation, some lines from Mr. Henry Lushington's poem "Inkermann." These lines I did quote in my lecture, and will quote them here, as they may

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give pleasure to some of your readers. Speaking of the Russian slain, Mr. Lushington says :—

Lay them there like soldiers—
Men that did not blench.
Many a sad serf-mother
Yearns for these at home ;
Yet she thinks, "My children
Never more shall come.
Few, alas, of many
Come back from the wars.
There they die, fulfilling
God's will and the Czar's !"

Oxford, May 23 G. ROLLESTON

Carp and Toads

IN reference to *Bufo calamita* attaching itself to the carp, and pressing its thumbs into the fish's eyes (see NATURE, May 12th), I would mention that the male Batrachia in the spawning season often attach themselves to any object, pressing the hands, on which is developed, at this season, a peculiar, black, wart-like structure, into the object which they seize—a stick, a human finger, or a carp as it appears, being sometimes hugged with spasmodic violence. A curious illustration of the reflex nature of this movement, and the inhibitory function of the cerebrum in regard to reflex actions, was witnessed by me lately, on cutting through the neck of a male toad. My finger was between the animal's fore legs, but on account of fright, or some other cerebral operation, no hugging action took place ; but directly the connection between the spinal cord and cerebrum was severed, the arms joined closely upon my finger, the thumbs being pressed into it in the usual way, and the headless body held firmly to me with considerable muscular power. Just as the leg of the brainless frog is withdrawn more rapidly from acidulated water, than is that of a perfectly sound and healthy specimen, so did the hugging action of the forearms fail to be brought about by contact of the extremities with a foreign body whilst the animal was whole, but took place immediately upon the severance of the cerebrum from connection with the rest of the cerebro-spinal axis.

Hampstead, May 16 E. RAY LANKESTER

WITH reference to the disease existing amongst the carp at the Château de Montigny, and its presumed connection with "the first days of spring," and the animosity of the toad for the carp, permit me to take up the cudgels, not for the early spring but for the poor maligned toad, which like other possessors of jewelled heads has already but too many enemies. On two occasions I have noticed the curious train of symptoms detailed by M. Duchemin, commencing with blindness, and ending in death. One occurred in Norway, and the trout and grayling were the only fish affected ; the other in Lord Bathurst's park in this town, when the pike only were attacked whilst the perch and tench escaped. In both these instances I instituted a series of experiments to ascertain the probable cause of death. No intestinal worms were discoverable, nor did any of the tissues appear congested or otherwise diseased, with the exception of the eyes, in which the cornea became opaque and friable so that on very slight pressure the crystalline lens escaped. The long duration of this blindness before death supervened, rendered it probable that starvation was at least usually the cause of death. In both cases spring was the time of the attack, but in neither were toads observed in proximity to the diseased fish ; indeed, in that part of Norway where the disease existed, toads are almost unknown. One cause only has as yet suggested itself to me, and that is the presence of diffused mud in the water. As both in Norway and Cirencester, works had been undertaken, just previous to the outbreak of the disease, which had had the effect of introducing a large amount of clay into the water, and the "early days of spring" were so far implicated that they were days of rain and melting snow, and thus the products of degradation were added to the mischief caused by the hand of man.

Cirencester, May 14 W. D. CROTCH

Meteorological Phenomenon

ON the afternoon of Sunday, the 22nd, a very curious appearance was noticed by many. The sky was hazy, and the sun was seen through the haze of a pink colour, inclining to purple. I see by a newspaper that the same was noticed at Dublin. A red or orange sun is common, but I never before saw its colour on the purple side of red. JOSEPH JOHN MURPHY

Old Forge, Dunmurry, Co. Antrim, May 24

Keen Sight of Fish

THE following extract from the remark book of Captain Robert A. Parr, of H.M.S. *Lyra*, may be of interest to your readers, bearing, as it does, such remarkable and trustworthy evidence of the keen sight of fish :—

"December 17th, 1867.—At noon, in lat. 0° 33′ S., long. 46° 13′ E., caught an Albacore, with 28 pistol bullets in its stomach. The ship's company had been exercised at pistol practice during the forenoon." G. F. M'DOUGALL

Hydrographic Dept., Admiralty, May 24

THE MULBERRY TREE

AN effort is being made to introduce once more into England the cultivation of the mulberry tree, and as the leaves of either the white or black variety (but especially those of the former) afford food for the silkworm, and both kinds will flourish in a tolerably mild and moist climate, there seems to be no reason why we should be altogether dependent upon foreign sources for a supply of raw material for the looms of Coventry and Macclesfield. Certainly the present is a favourable opportunity for making the experiment, as the price of silk has been largely enhanced by disease amongst the worms in the south of Europe, and by the destruction of the mulberry trees in China during the rebellion. At Yately, in Hampshire, Captain Mason has for the last three or four years been successfully engaged in rearing silkworms, and he calculates that if his mulberry plantations had been made upon a sufficiently extensive scale, a profit of 10*l.* an acre might have been easily realised. King James I. preceded him in this speculation, and imported ship-loads of mulberry trees from France with the view of encouraging the production of silk in England. In 1629 Walter Lord Aston was appointed "to the custody of the garden, mulberry trees, and silkworms near St. James's, in the county of Middlesex." But the scheme, like many others framed by the same monarch, proved abortive, and within a few years the mulberry garden became, in the words of Evelyn, "the only place of refreshment about the town for persons of the best quality to be exceedingly cheated at." Pursuing its history a little further we find the gardens converted into the site of Buckingham House, and in our own time Dr. King's allusion, written a century and a half ago, is a good deal more true than when he penned it :—

The fate of things lies always in the dark ;
What cavalier would know St. James's Park?
A princely palace on that space does rise,
Where Sedley's noble muse found mulberries.

Within our own memory a similar experiment was tried in the neighbourhood of Slough, but it failed, not from any deficiency in the supply of food, but from the difficulty and expense incurred in tending the worms and carding the silk. Mechanical processes have now, in a great measure, removed these drawbacks, and the whole process of cultivation is one which would afford suitable employment for women and children.

The vicissitudes of fortune experienced by the mulberry tree in England belong to a curious chapter in the yet unwritten history of Botany. In common with the vine and several other trees, the mulberry has been alternately fostered and neglected : but in spite of royal favour and many intrinsic merits (for its fruit is wholesome and its timber valuable), it has now become a rare tree in Britain. The specimens at Sion House enjoy the reputation of being the first planted in England; but the probability is that the mulberry was introduced by the Romans, for the Saxon name for the tree "mor-beam," is little more than an echo of the Latin *morus*, which again can be traced to a still more Eastern source. The Sion House trees were, perhaps, some of those imported by James I., but their interest is far inferior to that which attaches to the celebrated tree planted at Stratford by Shakespeare's own hand, and ruthlessly destroyed by a Goth of modern times. C. J. ROBINSON

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